

# USING TAILINGS AS AG. LIME IN ST. FRANCOIS COUNTY, MISSOURI: A FIRST LOOK



**A Presentation By:**

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**Missouri Department of Health and Senior Services**







# Special Thanks:

## Environmental Tracking Team Members

**Roger Gibson, Program Manager**  
**Pat Phillips, Consulting Epidemiologist**  
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**Pam Brauner, Liaison for Application Development**  
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## Collaborative Partners

**DHSS-Section for Environmental Public Health**  
**Missouri Department of Natural Resources**  
**Missouri Department of Agriculture**

# Background







Bonne Terre Tailings

Big River Mine Tailings

Leadwood Tailings

National Tailings

Federal Tailings







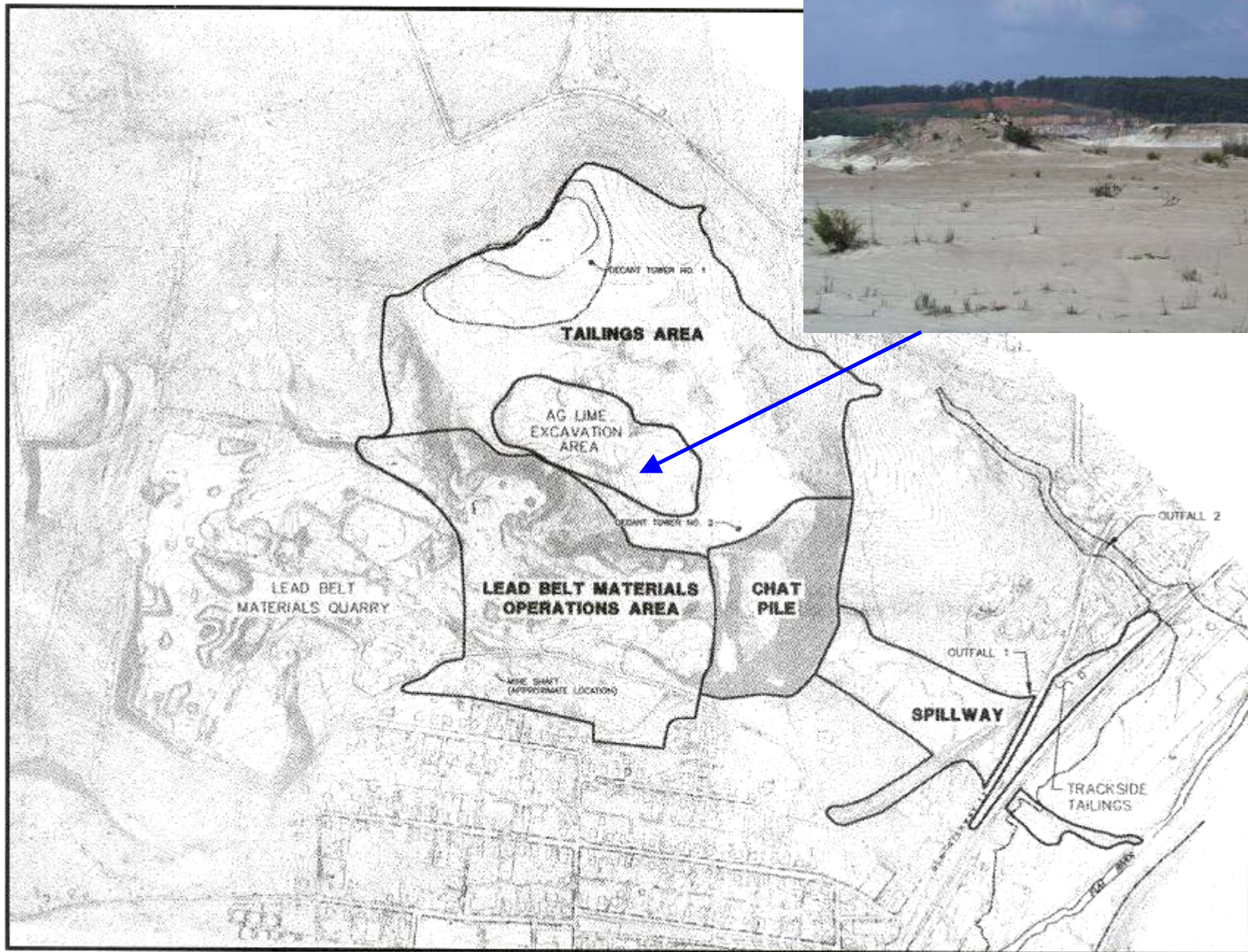
Federal Lead Company

Mill No. 4

Elvins, Missouri









# AGRICULTURAL LIMING MATERIALS SAMPLED FROM

JANUARY 1 THROUGH JUNE 30, 2003

Distributor	Date	U.S. Sieve Fraction, %				Fineness			Pounds/Ton		
	Sampled	+8	-8+40	-40+60	-60	%CCE	%Mg	Factor	ENM	EMg	
LAKE OZARK SAND & GRAVEL - BRUMLEY, ELDON, MO											
Stockpile #1											
Lab #0122	02-17-03		3.8	45.4	7.2	43.6	92.5	11.2	59.3	439	133
Lab #0495	04-29-03		1.3	36.8	9.6	52.3	92.5	11.1	67.3	498	149
Lab #0748	06-04-03		2.8	42.3	8.6	46.3	93.1	10.8	62.0	462	134
Stockpile #2											
Lab #0123	02-17-03		9.8	37.1	6.9	46.2	83.2	10.1	59.6	397	120
Lab #0749	06-04-03		13.6*	39.3	7.1	40.0	86.1	10.2	54.1	0	0
Stockpile #3											
Lab #0494	04-29-03		15.4*	37.8	6.3	40.5	83.8	10.0	53.7	0	0
Lab #0750	06-04-03		9.6	37.3	7.6	45.5	83.1	9.8	59.4	395	116
LEAD BELT MATERIALS CO INC, FLAT RIVER, MO											
Stockpile #1											
Lab #0189	03-07-03		0.1	25.7	24.4	49.8	87.8	10.3	70.9	498	146
Lab #0374	04-15-03		1.6	18.5	18.8	61.1	89.5	10.3	77.0	551	159
Lab #0624	05-22-03		0.6	3.5	11.1	84.8	87.7	10.3	92.3	648	190
LILE QUARRY INC., STRAFFORD, MO											
Stockpile #1											
Lab #0036	02-05-03		0.7	47.8	6.4	45.1	91.3	10.8	60.9	445	132
Lab #0193	03-03-03		0.7	51.9	5.7	41.7	91.5	10.9	58.1	425	127
Lab #0629	05-19-03		0.7	49.9	6.3	43.1	89.5	10.7	59.4	425	127
LIMPUS QUARRIES, INC. (BATES CITY), BATES CITY, MO											
Stockpile #1											
Lab #0771	06-10-03		6.2	54.9	9.1	29.8	91.4	0.7	49.0	358	7
Stockpile #4											
Lab #0056	02-13-03		5.6	45.6	9.5	39.3	90.1	0.2	56.4	407	2
Lab #0331	04-08-03		5.8	51.1	8.7	34.4	90.1	0.2	52.4	378	2
Lab #0571	05-14-03		5.5	48.8	8.6	37.1	90.4	0.2	54.5	394	2

**Table 1****Contaminants detected in the chat/tailings at the Elvins Mine Tailings Site  
in Parts per Million (ppm) (2,3,4)**

Contaminants	Range	Mean	Screening Value & Source
Lead <sup>1</sup> (>90 samples)	851 - 11,600	4,392	260 Tier 1 STARC <sup>3</sup>
Lead <sup>2</sup> (3 samples)	1,500 - 8,600	5,067	260 Tier 1 STARC <sup>3</sup>
Cadmium <sup>1</sup> (>90 samples)	19.8 - 202	103	110 Tier 1 STARC <sup>3</sup>
Cadmium <sup>2</sup> (3 samples)	53 - 130	101	110 Tier 1 STARC <sup>3</sup>
Zinc <sup>1</sup> (>90 samples)	108 - 11,900	5,482	38,000 Tier 1 STARC <sup>3</sup>
Zinc <sup>2</sup> (3 samples)	2,90 - 8,400	6,400	38,000 Tier 1 STARC <sup>3</sup>

<sup>1</sup> Wixson B., Gale N., Davies B. A study on the possible use of chat and tailings from the old lead belt of Missouri for agricultural limestone. 1983 December.

<sup>2</sup> CDM Federal Programs Corp. Site screening inspection report for site assessment activity at Elvins Mine Tailings site, Park Hills, Missouri. 1994 August 24.

<sup>3</sup> Missouri Department of Natural Resources, Clean-Up Levels for Missouri (CALM), September 2001.

> = greater than



## Contaminates Detected in Chat/Tailings Piles In Parts Per Million (ppm)

Piles	Samples	Lead	Mean	Cadmium	Mean	Zinc	Mean
Elvins	91	851 - 11,600	4,392	19.8 - 202	103	108 - 11,900	5,482
Bonne Terre	88	1,300 - 7,000	3,515	3.0 - 29.5	13.9	51.3 - 967	541
National	93	1,640 - 9,283	3,508	2.0 - 87	7.2	81 - 5,055	457
Leadwood	98	597 - 17,000	2,444	9.3 - 1,870	267	633 - 25,800	5,009
Federal	Not Listed	580 - 2,830	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Big River	90	100 - 5280	1,099	1.0 - 31	13	160 - 1,820	808

Source: ATSDR Preliminary Public Health Assessment: Big River Mine Tailings Desloge (a/k/a St. Joseph Minerals)

## Area farmers critical of EPA ruling

Local News

Saturday, December 13, 2003

*By LEROY SIGMAN\Daily Journal Staff Writer*

PARK HILLS -- There was heavy criticism directed toward the U.S. Environmental Agency for banning the sale of mine tailings for use as agricultural lime during a public meeting here Thursday night at Central High School concerning the cleanup of the Elvins chat pile and tailings field. David Moore, a farmer from the Bismarck area, said the EPA action halting the sale of tailings for agricultural use was done without any scientific information to support such a move. He called on the federal agency to come up with a solution to the problem at the Elvins chat pile that would allow the continued use of material for agricultural lime. "Farmers have used tailings for agricultural lime for 75 years," Moore said, noting that until recently there have been no concerns expressed by the government.

The ban imposed in August has made it necessary for local farmers to go to more expensive alternative measures to control the acid content of soil. This is an added expense, Moore said, that small farmers cannot afford. He said they are already struggling and this is just one more additional cost they should not have to bear.

Ben Davis, a livestock consultant with the University of Missouri Extension Center, said a study conducted by the University of Missouri-Rolla shows that use of tailings for agricultural lime does not pose a health hazard. He said the study indicates lead in the tailings is not absorbed by the plants grown in those fields. The study also did not find any environmental hazards created by the use of tailing on farm land.

According to Davis, the study suggests "agricultural lime is the best way to get rid of the chat piles." If nothing more, Davis and several in the audience suggested, the EPA should conduct further studies to determine if this would not be the best direction to go.

Bruce Morrison, the EPA's project manager for St. Francois County, suggested he does not have a lot of faith in the findings of the study. He said he does not believe it was done scientifically and did not look at all of the factors that should be considered.

While he is not disputing the finding that plants do not absorb the lead from the tailings when it is used as agricultural lime, Morrison said the EPA's concern is about its uncontrolled use. Local farmers might be aware of the lead and cadmium content of the tailings, but those not in this area might not know about that and thus not be aware of the risks involved.





# County Information

**STARVED**  
BY LACK OF  
PLANT FOOD

**NOURISHED**  
ON  
PHOSPHATE  
AND LIME



# PRIME FARMLAND

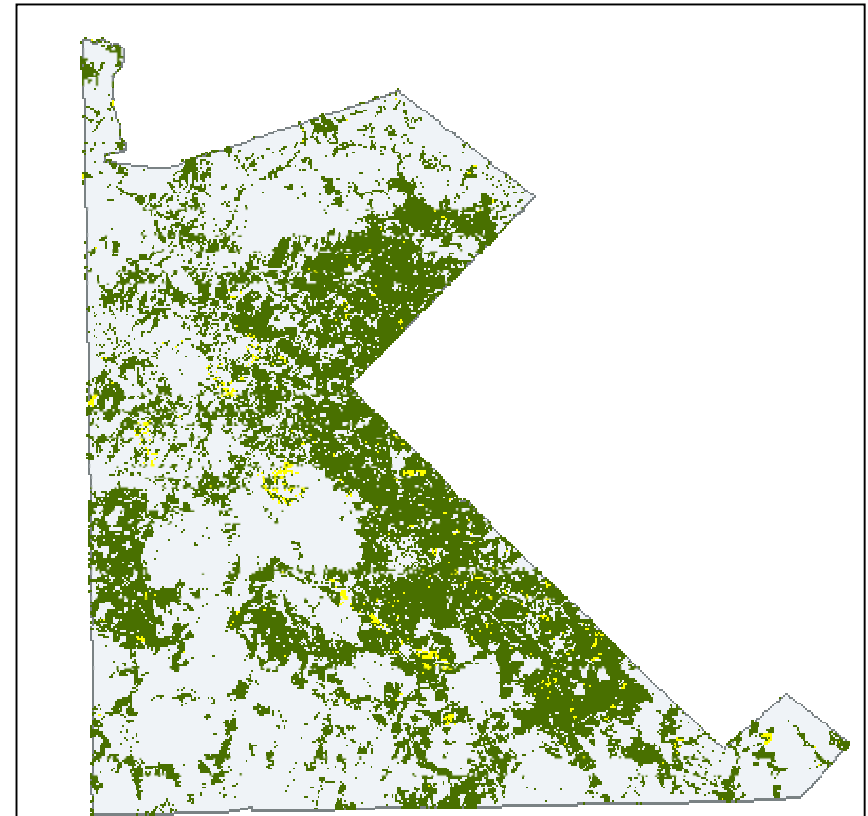
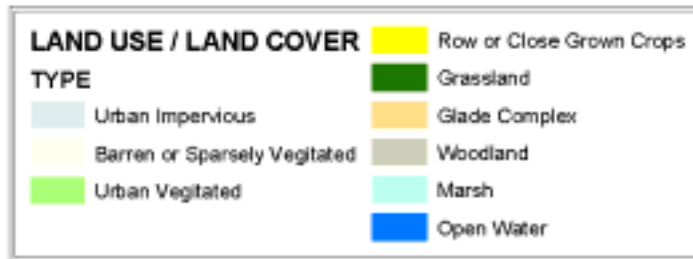
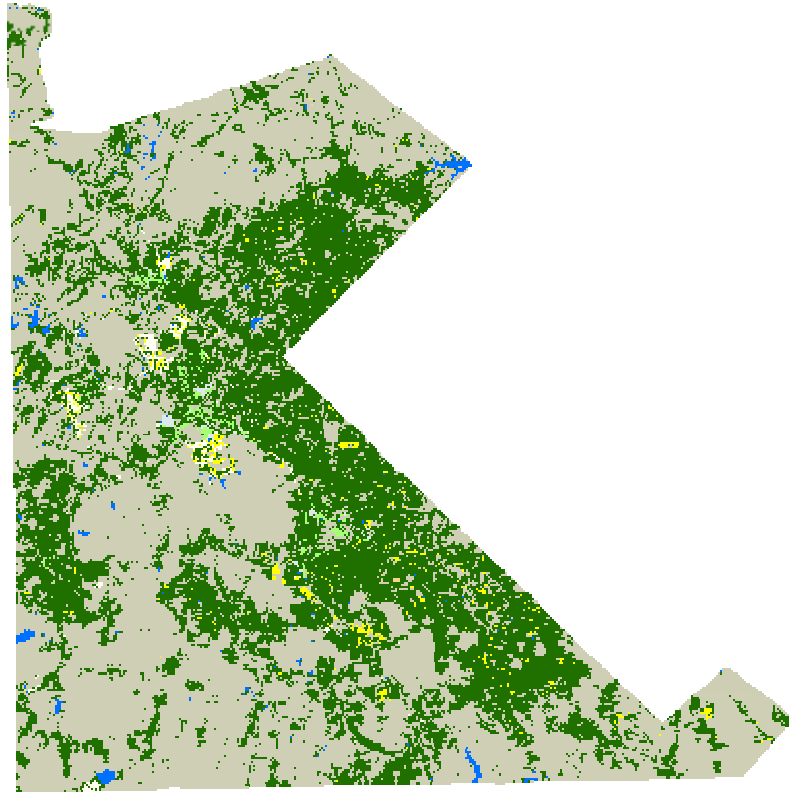
## Legend

- Not Prime Farmland
- Prime Farmland if Drained
- Prime Farmland if Protected from Flooding
- All Areas are Prime Farmland
- Farmland of Statewide Importance





# LAND USE / LAND COVER



## AGRICULTURAL FACTS

Total Acres:	287,677
Total Cropland (acres):	60,660
* Harvested	29,661
* Pasture Land	28,049
* Other	2,950
Total Farms:	649
* Average Size (acres)	174
* Percentage of acres	39.2%

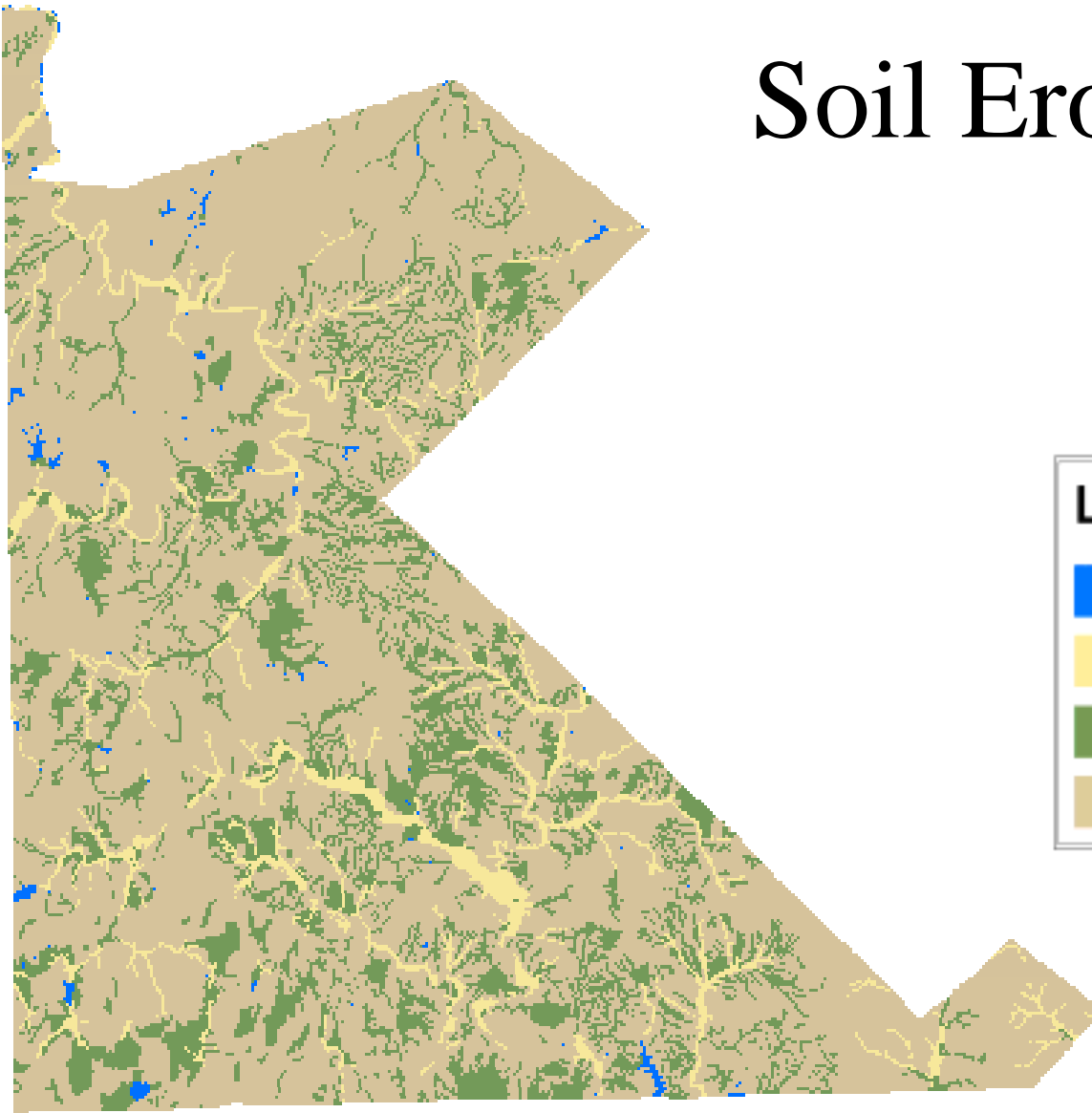
Source: 1997 Census of Agriculture











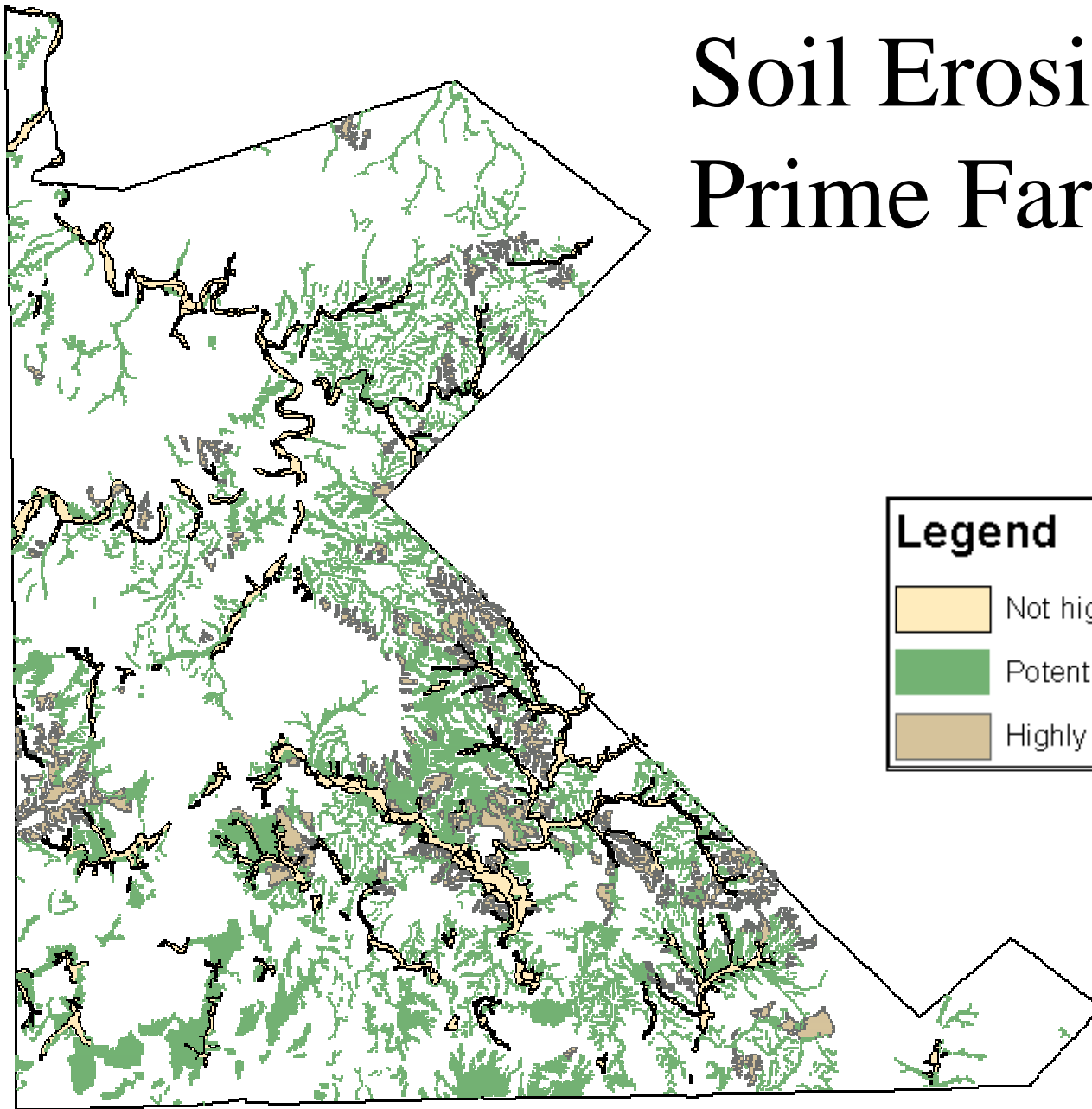
# Soil Erosion Profile






## Legend

-  Open Water
-  Not Highly Erodible Land
-  Potentially Highly Erodible Land
-  Highly Erodible Land

# Soil Erosion Profile: Prime Farmland



## Legend

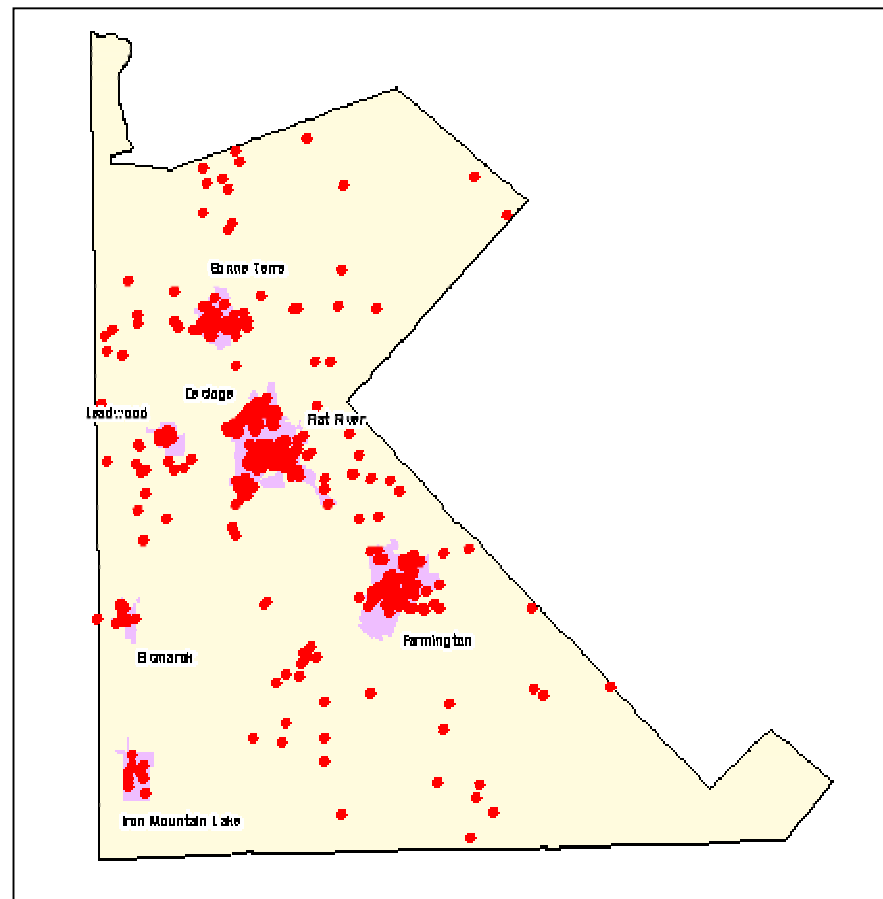
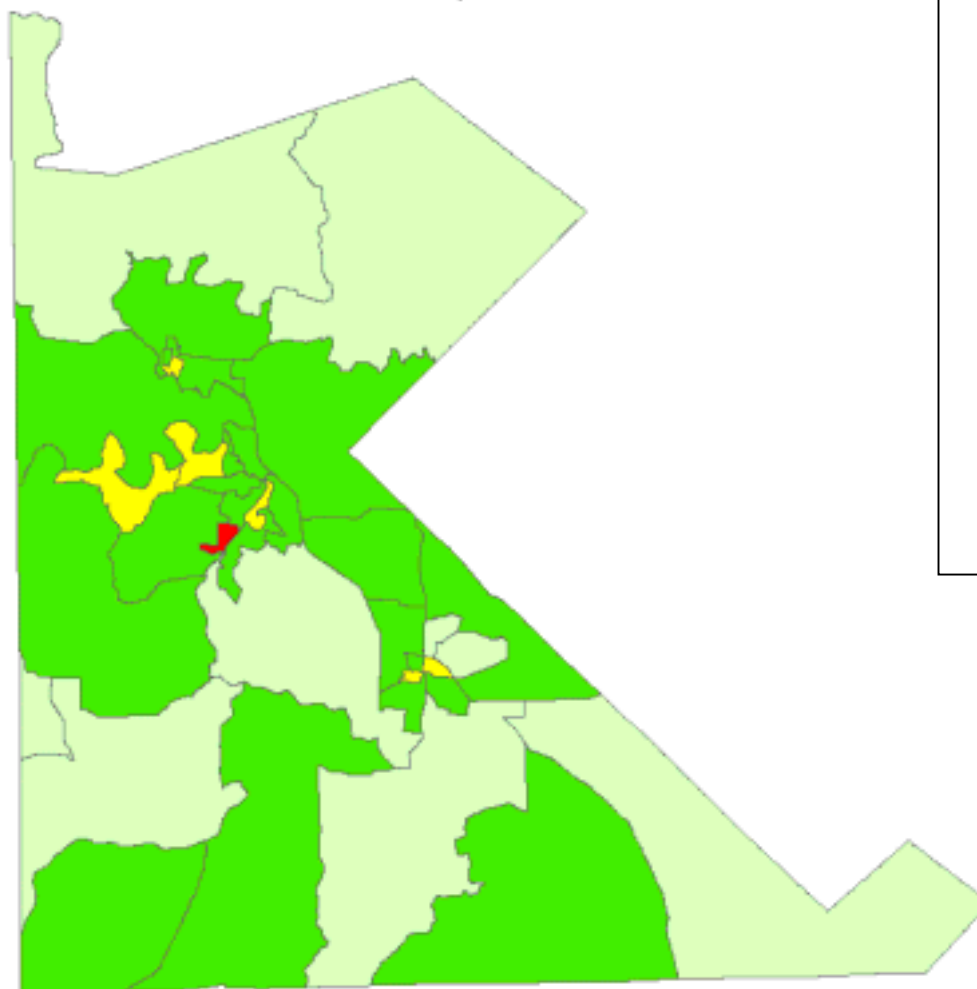
-  Not highly erodible land
-  Potentially highly erodible land
-  Highly erodible land



# ELEVATED BLOOD LEAD LEVELS IN CHILDREN



# Blood Lead Tests and Rates: Children Under 72 Months Of Age: 2001



## Legend

TESTS PER 100 CHILDREN

01.00 - 10.00

10.01 - 20.00

20.01 - 30.00

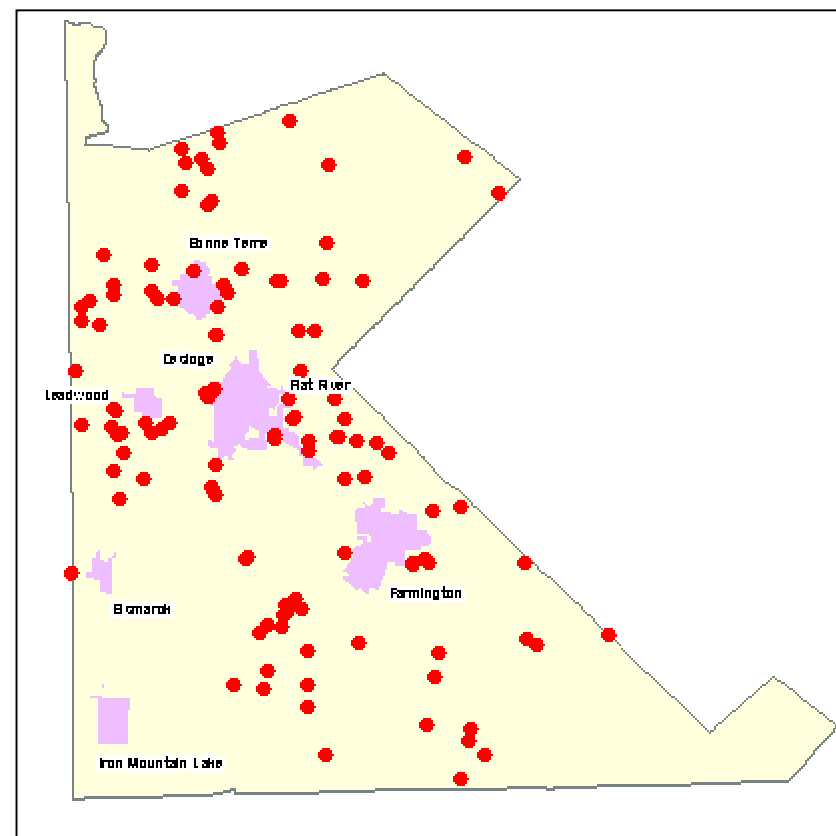
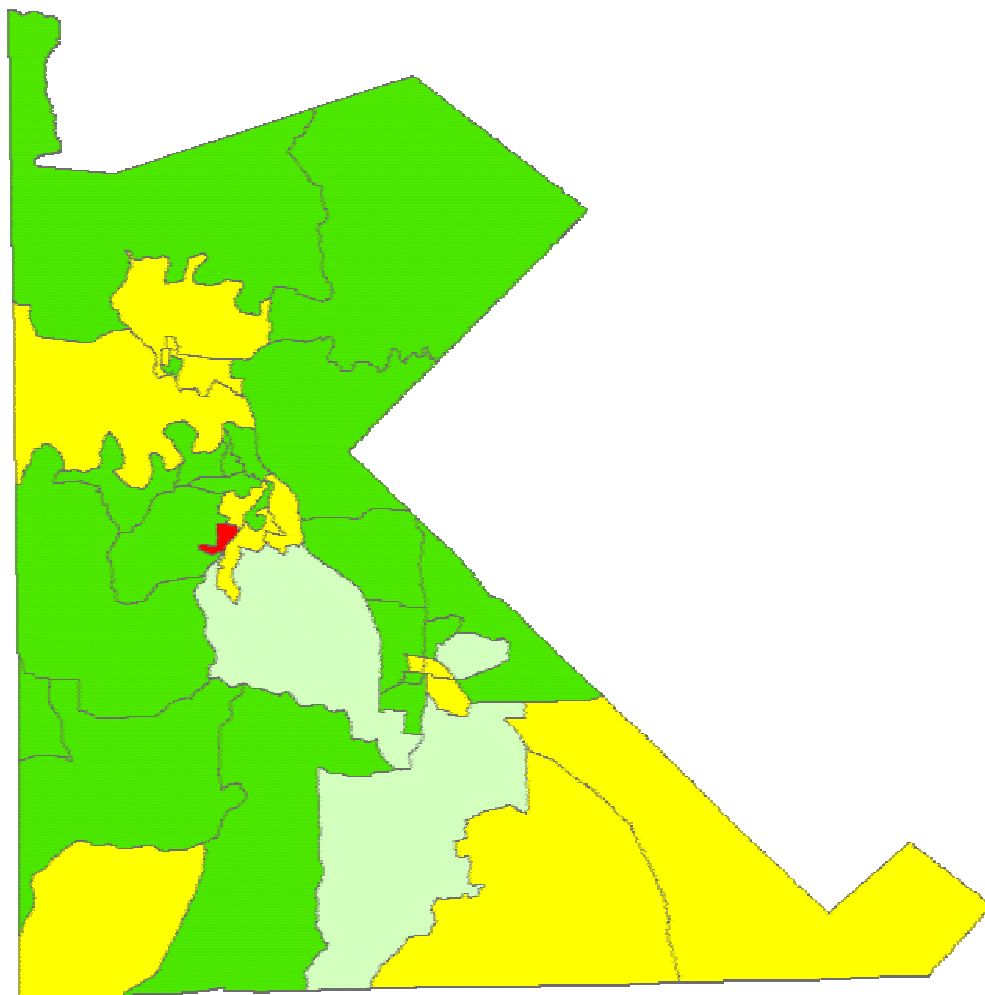
30.01 - 40.00

40.01 - 50.00





# Blood Lead Tests and Rates: Children Under 72 Months Of Age: 2002



## Legend

TEST PER 100 CHILDREN

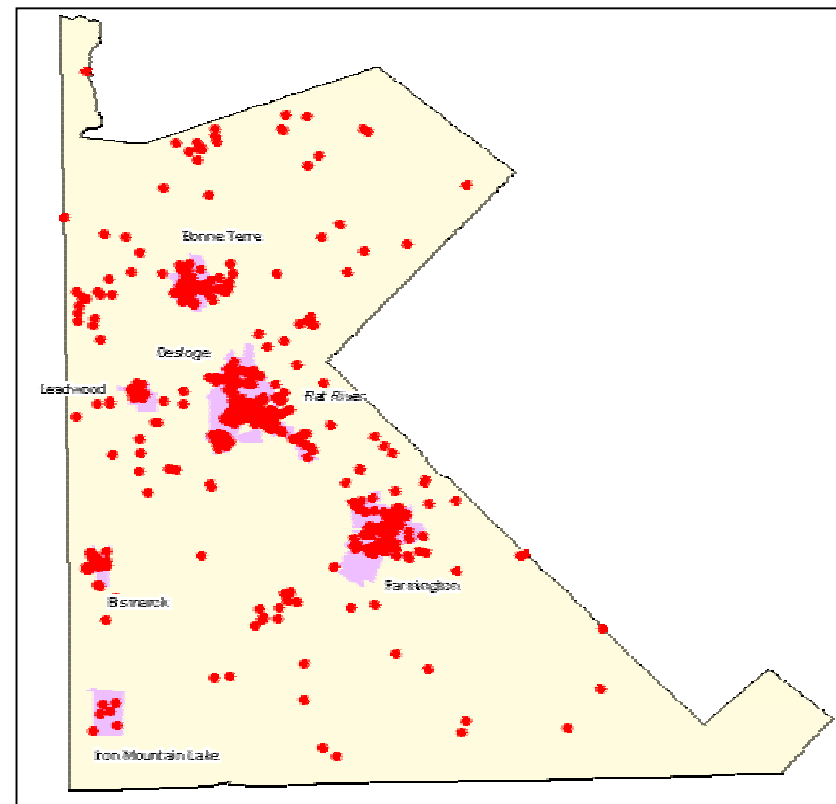
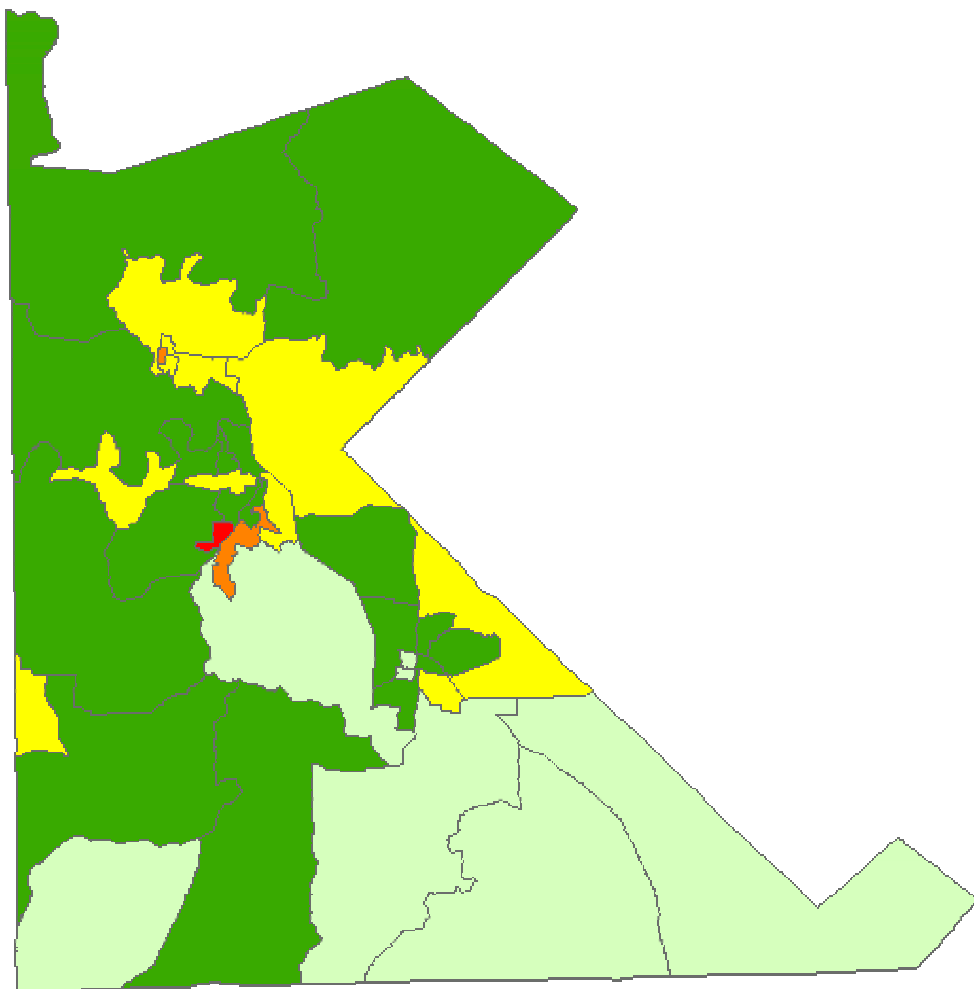
1.00 - 10.00

10.01 - 20.00

20.01 - 30.00

30.01 - 40.00

# Blood Lead Tests and Rates: Children Under 72 Months Of Age: 2003

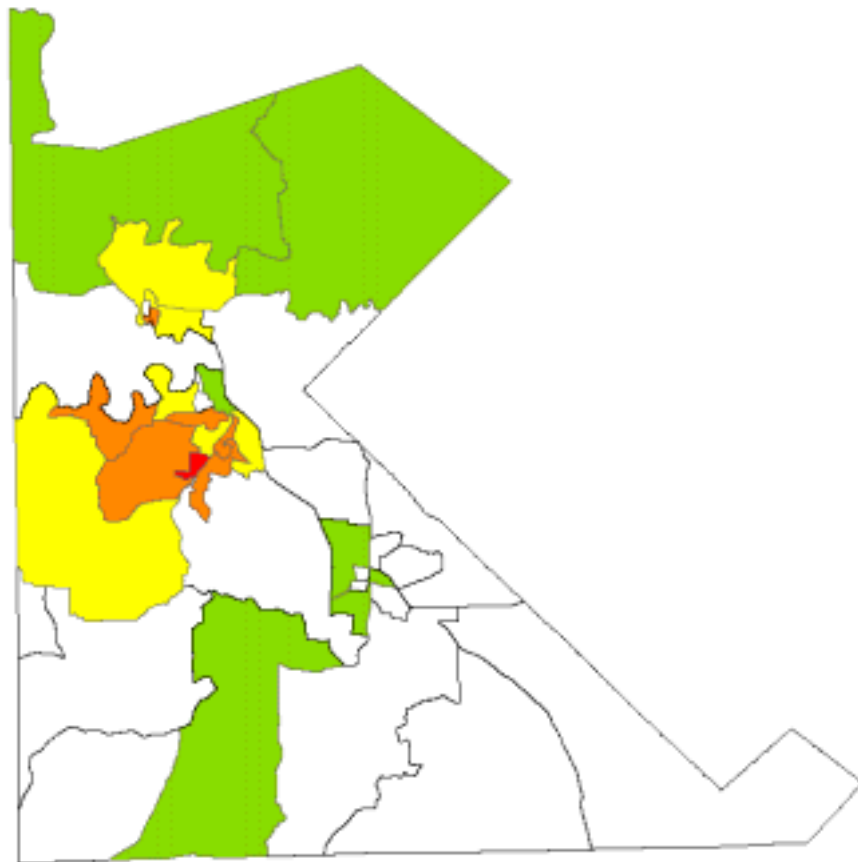
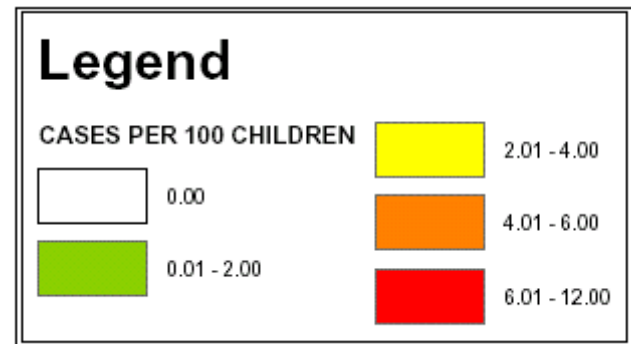
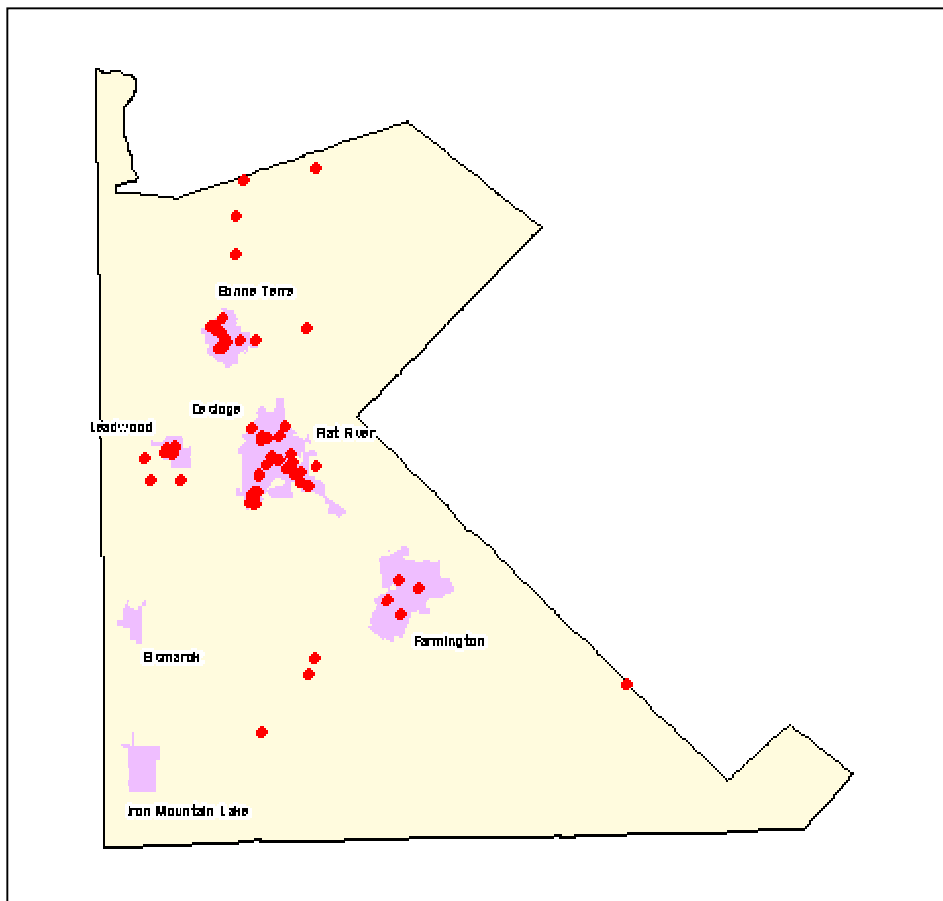


## Legend

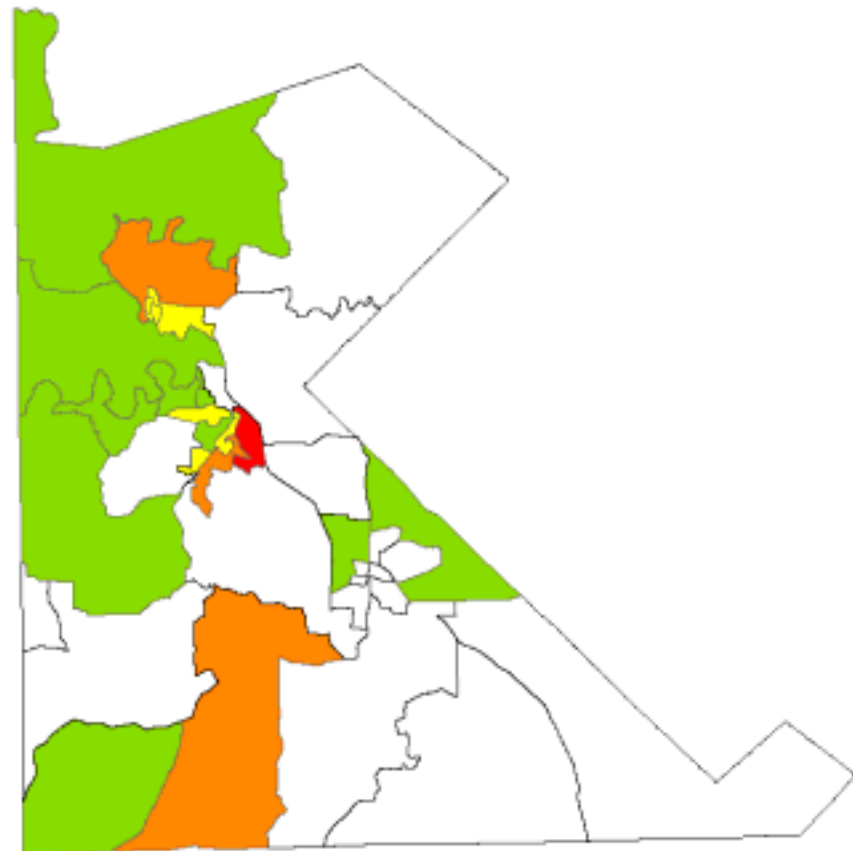
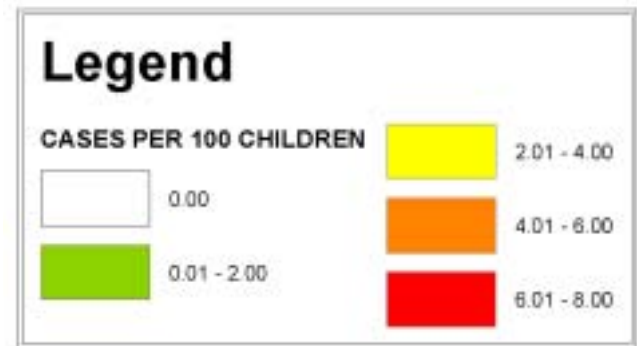
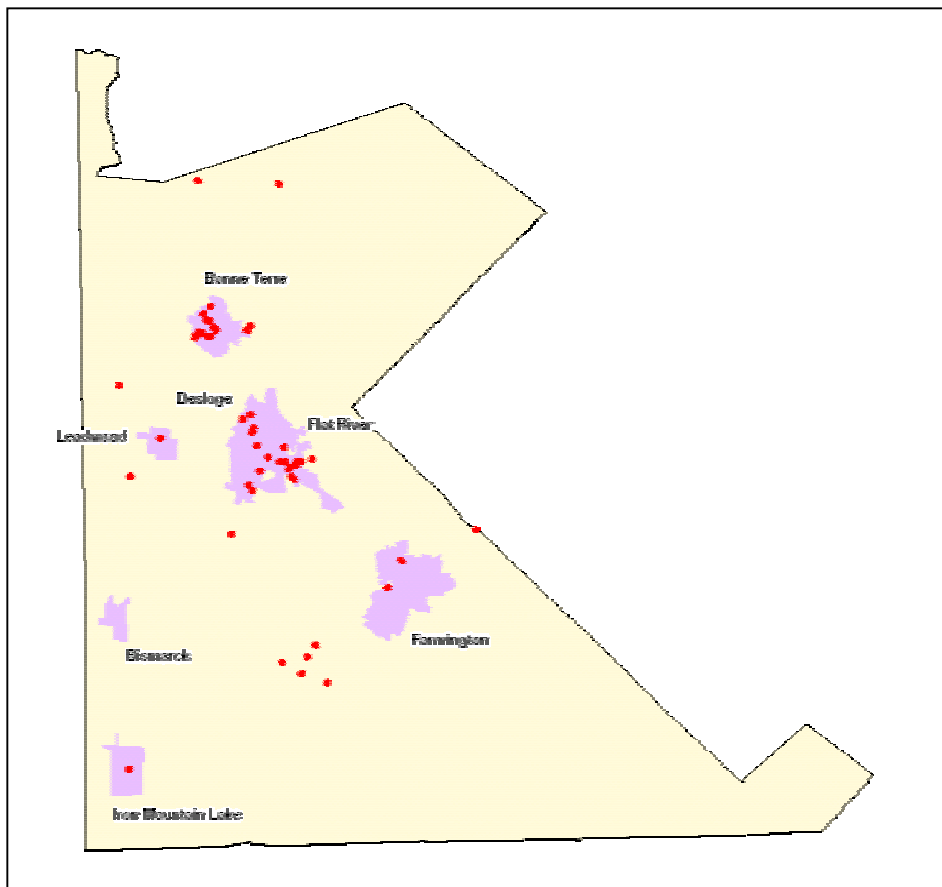
### TESTS PER 100 CHILDREN

1.00 - 10.00	20.01 - 30.00
10.01 - 20.00	30.01 - 40.00
	40.01 - 50.00

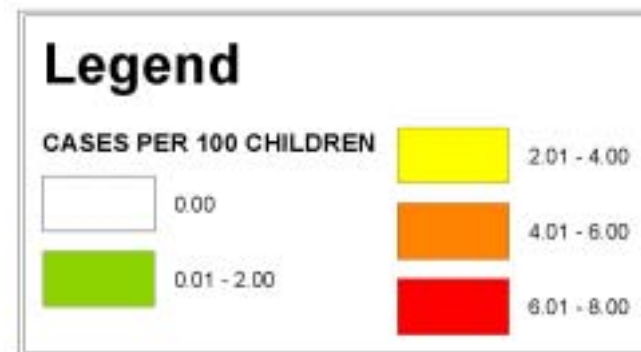
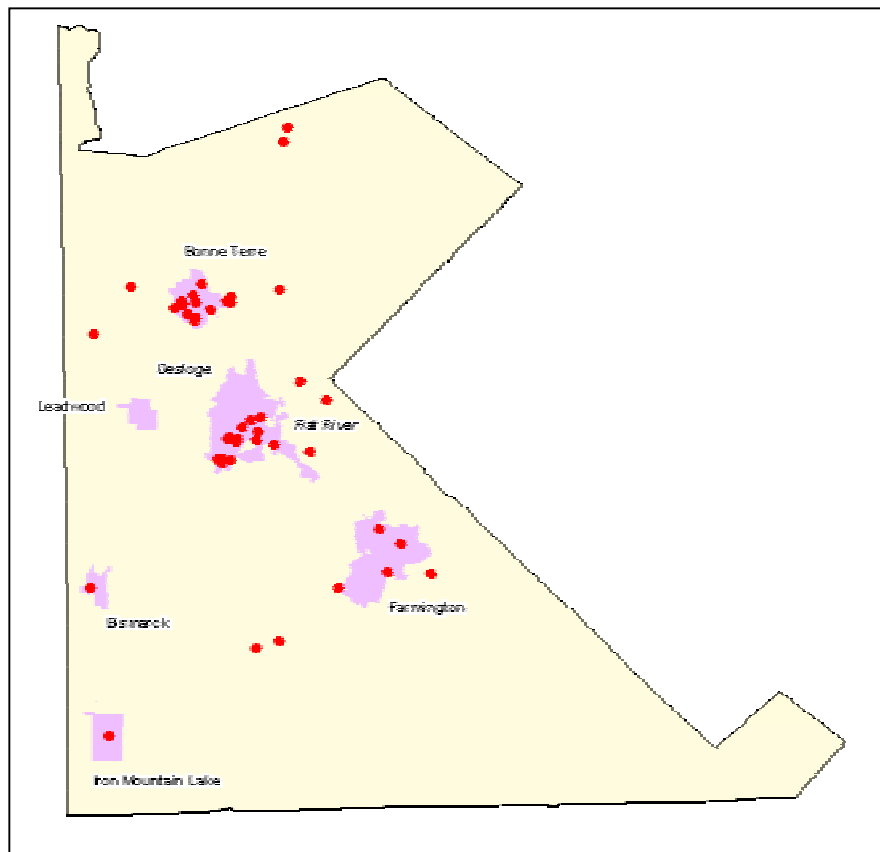




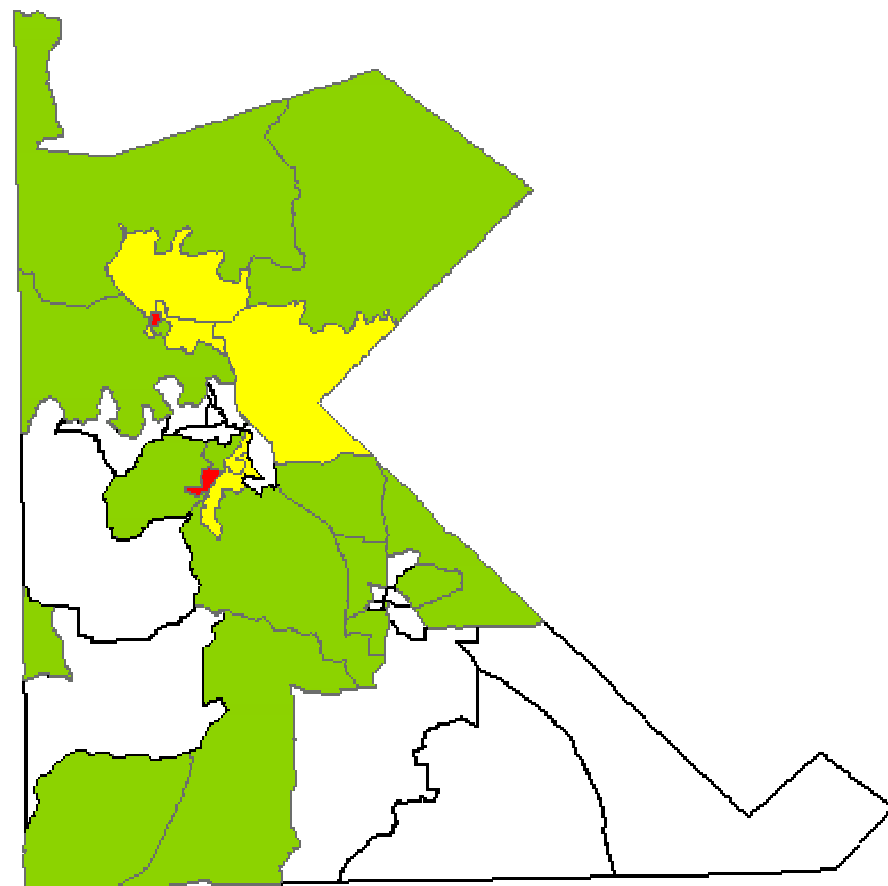
## Elevated Blood Lead Cases and Rates: Children Under 72 Months Of Age: 2001



## Elevated Blood Lead Cases and Rates: Children Under 72 Months Of Age: 2002

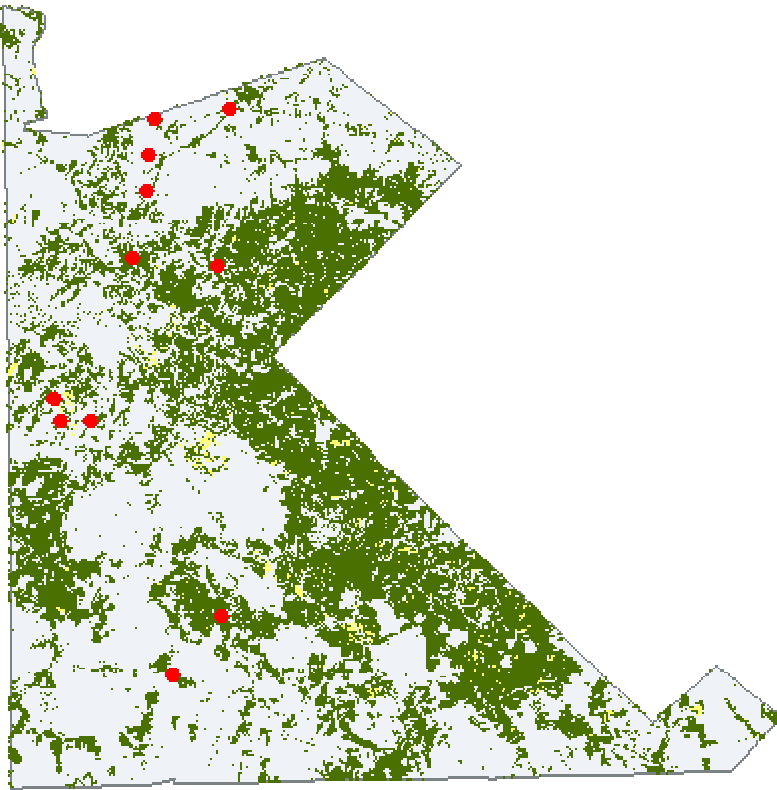


## Elevated Blood Lead Cases and Rates: Children Under 72 Months Of Age: 2003

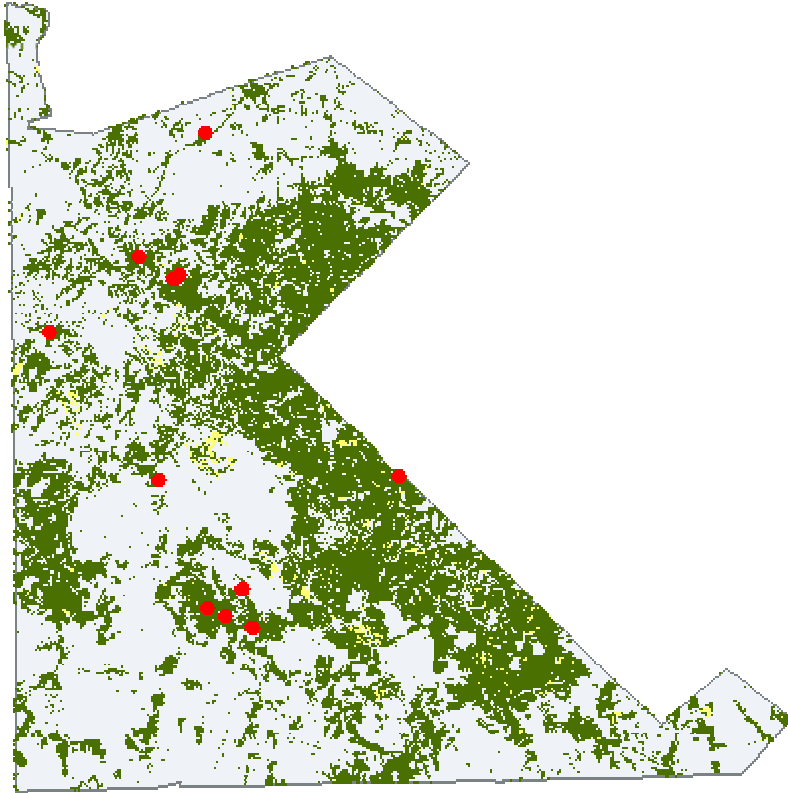




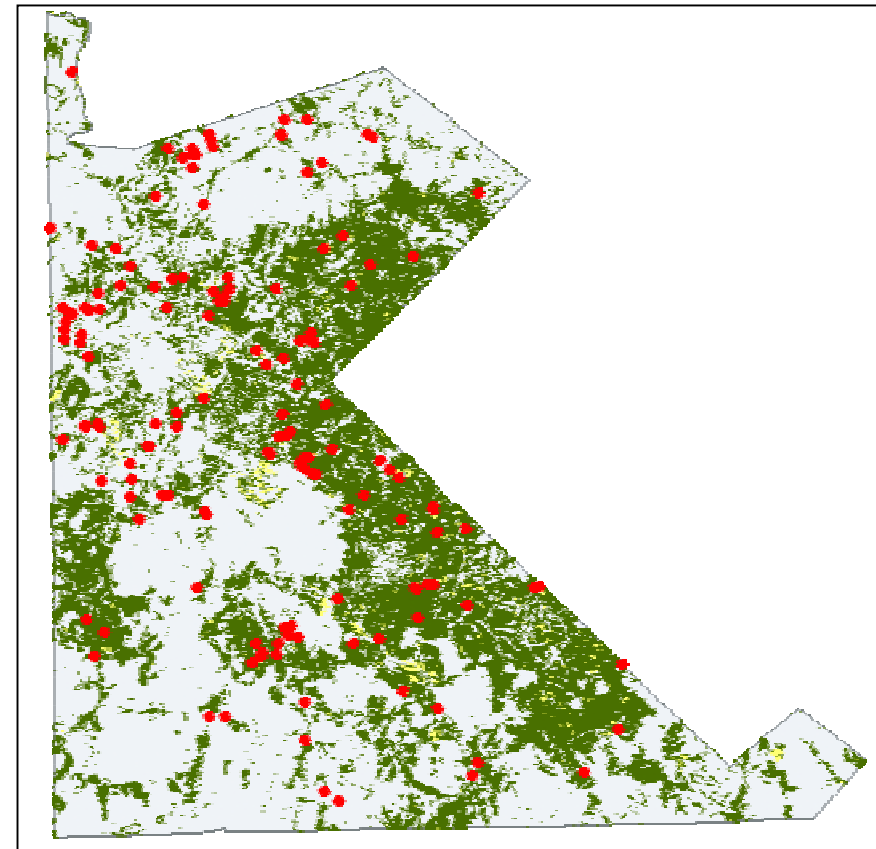
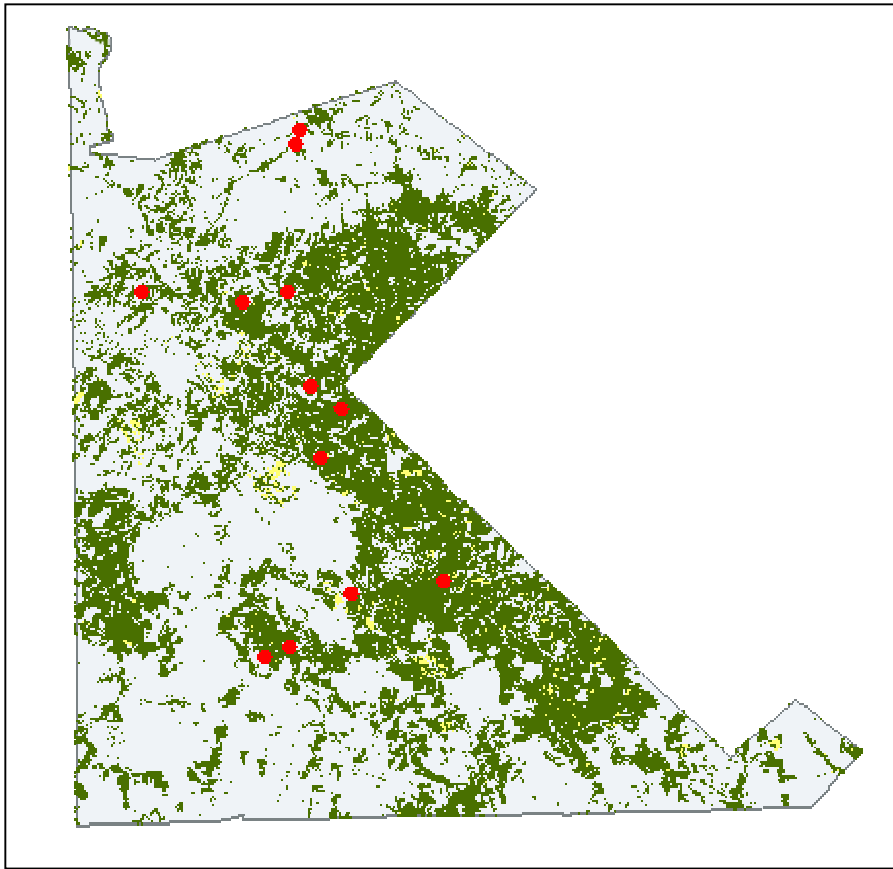
# Elevated Blood Lead Cases And Tests On Crop and Pasture Lands: 2001



# Elevated Blood Lead Cases And Tests On Crop and Pasture Lands: 2002

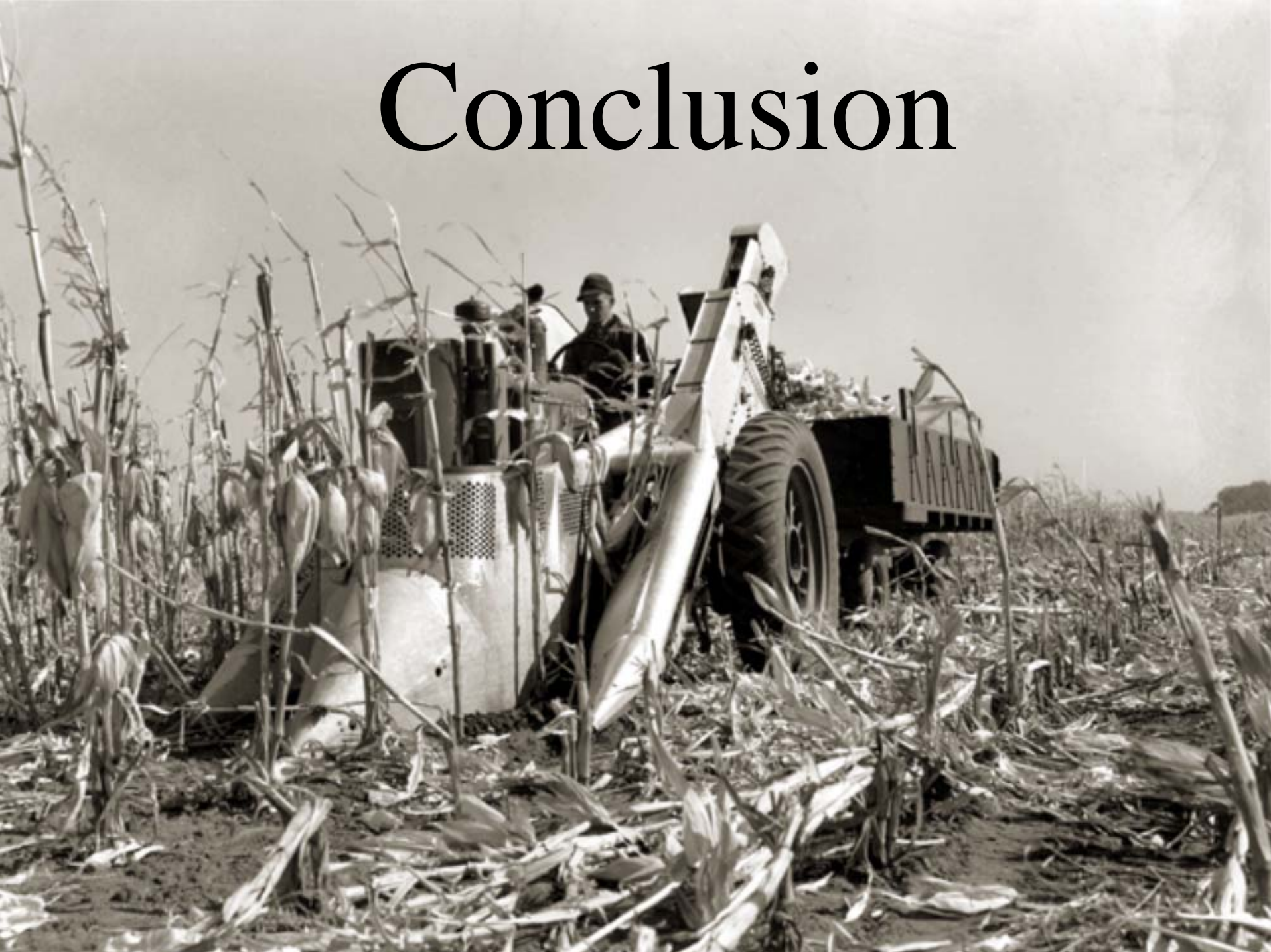


# Elevated Blood Lead Cases And Tests On Crop and Pasture Lands: 2003





# Conclusion



SUMMARY OF FINDINGS	
TESTS	

[illegible]

EBL									
YEAR		ELEVATED	% OF TESTED	URBAN	% OF ELEVATED	NON-URBAN	% OF ELEVATED	NON-URBAN EBL ON CROP LAND	% OF NON-URBAN EBL
2001		75	12%	64	85%	11	15%	7	64%
2002		61	8%	47	77%	14	23%	11	79%
2003		47	6%	35	66%	12	34%	8	67%





# Final Determination

**That the process of selling mine tailings for agricultural lime not resume until it has been determined that it does not pose a health risk or the appropriate controls, including handling, transportation, and application of the material have been developed and a long-term stewardship plan for the properties has been developed and put in place**



# PUBLIC HEALTH ACTION PLAN



- **DHSS/ATSDR will work with St. Francois County Health Department to target rural portions of the county for blood lead screening.**
- **DHSS/ATSDR will work with the interested parties to participate in determine if the use of tailings materials as agricultural lime poses a health risk.**
- **DHSS/ATSDR will provide input into the development of appropriate controls, including handling, transportation, and application of tailings as agricultural lime. Additionally, we will assist in the development of a long-term stewardship plan for the properties that have had tailings applied as agricultural lime.**

# The End



For further information on anything seen in this presentation please contact:

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